

MEMORANDUM
February 8, 2017~~February 25, 2005~~

TO: JULIE WROBLE (U.S. EPA)

FROM: D. WAYNE BERMAN, PH.D. (AEOLUS, INC.)

RE: RESPONSES TO COMMENTS ON THE:

**“DRAFT EVALUATION OF THE IMPLICATIONS OF
AIRBORNE ASBESTOS EXPOSURE CONCENTRATIONS OBSERVED
DURING SIMULATION OF A SELECTED SET OF COMMON, OUTDOOR
RESIDENTIAL ACTIVITIES CONDUCTED AT THE NORTH RIDGE
ESTATES SITE, KLAMATH FALLS, OREGON”**

COMMENTS AND RESPONSES

Page 1, middle paragraph:

Comment:

*(No Comment, just a correction where the word, “modeling” was replaced with
“projecting”)*

Response:

In the executive summary (Last paragraph of first section), it is not just modeling results that are modified in this report. Observed results are also modified to better account for uncertainty. I will therefore modify this sentence in the manner that we discussed (see revised text).

Page 1, Last Paragraph

Regarding all of the comments associated with the nature of the EPA study, per our discussion, it is clear that the EPA study was designed to present a conservative estimate of risk that was unlikely to under estimate general risks for the pathways studied. This is in response to the set of comments like:

“This is a bit strong. The intent was to determine air concentrations of fibers for real activities, yes, the intent was to do it during favorable meteorological conditions.”

Therefore, given the above, I will modify these sentences to more carefully reflect the above idea.

Page 2, Top of Page

Comment:

“I’m not a fan of this particular phrase.”

Response:

In the first paragraph in the section, "Response to Comments" I will shorten the phrase to "fall into the range that is potentially considered acceptable by EPA." This is in response to the indicated comment following our discussion.

Page 2, Top of Page

Comment:

"But this is questionable. Also, the risks presented within this document are not summed with risks from other site sources – this potentially underestimates risk,"

Response:

This refers to the phrase, "upper bound estimates" in the text and (as we discussed) it is important to remember that the time estimates applied for conducting these activities represent the 95th percentile that the EPA estimates for the total amount of time that children spend outdoors. Therefore, the risk estimate presented for the most severe exposure pathway (i.e. the one associated with the greatest estimated exposure) is more conservative than the estimate that would be derived from summing exposures across outdoor pathways. This is because, when summing across pathways, one would have to apportion the time spent outdoors among the pathways. Thus, this would include periods of time during which exposure would be lower than the level currently assumed.

Page 6, top of page

Comment:

"Given the weight of this information, why was there such a long delay in when this information was provided to EPA? Does MBK have plans to communicate this information to the community?"

Response:

This comment raises three issues about which there may be disagreement or misunderstanding.

The first issue concerns the process of receiving and interpreting data and reporting back to EPA.

The data evaluated in my simulation report were developed by EPA and I had to acquire them from EPA. These data were and are available to everyone associated with the site. Thus, my evaluating these data in no way prevented anyone else from independently doing the same thing at the same time.

EPA sent preliminary data to me in early October, 2004. There were reporting problems with the data that needed to be corrected before the data could be finalized and used.

As I am sure you recall, it took several three-way conversations between EPA, the laboratory, and me before the reporting problems were corrected. A second revision of the data was sent to me on October 27th, but even this revised data set contained errors. Importantly, even now there are unresolved quality control issues associated with these data.

EPA evaluated the same data independently and concluded that the data largely reinforced the model of the site that was presented in the Preliminary Soil Report, I generally concur with this finding. However, I felt that there were more robust ways that the data could be evaluated, which would provide a better indication of the uncertainty that we currently face at the site. Thus, with MBK's approval, I set about to complete a more robust evaluation.

It is also important to remember that this is not my only project and that none of the previous data gathered at the site indicate that residents might be experiencing any unacceptable exposures to asbestos. Thus, there was not more than normal urgency associated with this task.

When I had completed enough of my more robust evaluation to feel comfortable that my findings were correct, I immediately initiated a process that resulted in my drafting a proposed warning to residents. Because the warning and supporting data for it were ready before the final report could be completed. MBK's attorneys provided the proposed warning to EPA in a letter to Cliff Villa dated December 10, 2004. The supporting tables were also provided to EPA at that time. Neither the nature of the proposed warning nor the tables have changed materially between the time they were first submitted to EPA and the time that the full, draft report was ultimately submitted to EPA. Finally, despite MBK's bankruptcy filing, which interrupted my work status, it is my understanding that MBK offered to have me interpret the tables and information supporting the proposed warning for EPA and that EPA never requested such assistance. For all of these reasons, I completely disagree with the suggestion that there was any delay in submitting important information to EPA.

The second issue concerns the weight of evidence evaluated in this report.

With respect to this issue, the findings from the report primarily suggest that the *uncertainty* of the available data is greater than we originally anticipated. Therefore, by properly accounting for this greater uncertainty, conservative estimates of risk had to be raised. At the same time, our best estimates of risk have not changed.

As the report indicates, I cannot currently dismiss the possibility that unacceptable risks can occur at the site. That is not the same thing as concluding that unacceptable risks are in fact occurring at the site. It is likely that unacceptable risks are not occurring at the site, but I cannot say this with sufficient certainty to dismiss the possibility that some risks that can occur at the site are unacceptable.

Therefore, given the status of knowledge, the best course of action is to take prudent, health protective measures while we complete a limited and focused study on an expedited time-scale that will get us sufficient information either to better bound the estimates of current risk or, if not, to better indicate how best to mitigate such risks. Proposing a warning to residents was prudent and health protective under these

circumstances, especially since the exposures that we are concerned about only occur in connection with stationary activities involving close contact with dry dirt (such as occur during gardening or children playing in the dirt). As a practical matter, such exposures do not occur during the winter. In fact, I assume that EPA's lack of response or urgency with respect to my original, proposed warning may have been related to this consideration.

The third issue concerns communication of information to interested persons, particularly the residents of North Ridge Estates.

With respect to this issue, it is my understanding that the existing Consent Order for the removal action governs communications with residents and that EPA is essentially in charge of such communications. Further, it is my understanding that MBK's ability to communicate directly with certain homeowners is limited because of the pending lawsuit. That said, given the highly technical nature of the draft simulation report itself (including the executive summary), Appendix B was included in the report to facilitate communication with lay persons about the nature of risks and the process of assessing risks at North Ridge Estates.

An important part of that communication is that there is additional work to be done, some of it on an expedited basis, to address the concerns of all interested parties. I have developed a two-phase plan to do this. Phase one will take only 4 to 6 weeks to complete and involves re-analysis of existing samples from the site with greater sensitivity to better understand the amphibole risks. Phase Two may take from 4 to 6 months and the effort may be modified pending the results of the Phase One work. In general, Phase 2 will involve sampling and analysis over selected areas of the entire site to better understand general risks and to reduce uncertainties regarding our estimation of risks at the site.

Finally, I might add that, given the facts of the situation (which contradict the implications of EPA's comment) and the fact that this comment has now been distributed broadly among the interested parties at this site, I trust that EPA will set the record straight.

Page 6, second paragraph

Comment:

"Perhaps additional sampling is needed at this location,"

Response:

This refers to the observation of three amphibole structures in one of the composite samples that was collected by EPA to represent conditions on individual parcels and was subsequently analyzed using the Glove Box Method. A combination of additional QC work, re-analysis of a selected subset of existing samples (at increased sensitivity), and collection and analysis of a targeted set of additional field samples (including collection of one or more additional samples from the area represented by this particular composite) should be conducted to provide the improved understanding of the nature of the amphibole problem at the site that is needed to support decisions concerning next steps.

These activities should be expedited so that we can move toward resolution of this problem.

Page 10, third paragraph

Comment:

These are embedded corrections, no comment.

Response:

Regarding correction of the size range indicated for protocol structures. The size range indicated is correct for the definition of protocol structures as it stands (without correction). However, to add additional conservatism to this study, we agreed by convention during the study to include structures that are reported to exhibit a width that is precisely equal to 0.5 :m in counts of protocol structures. Therefore, I will leave the definition as it stands in the text and add a footnote indicating what was actually done.

Page 11, paragraph after bullets

Comment:

This is an embedded, proposed modification.

Response:

I will be happy to add a footnote suggesting that short structures may contribute to non-cancer effects. However, I will need a citation to go with it. Can you provide one?

Page 12, top of page

Comment:

“Personal communications cited should be included in the list of references with names and dates.”

Response:

I will be happy to add the appropriate citations to the reference list:

Page 15, first paragraph, Section 5.2

Comment:

This is in response to an embedded modification

Response:

The dust samples collected as part of the EPA study were not collected under ambient conditions. They represent dust concentrations that occur at waist height during the various activities performed.

Page 18, middle of page

Comment:

“Glove box is not mentioned prior to this so it’s a little confusing”

Response:

I will add a footnote introducing the glove box.

Page 26, bottom.

Comment:

“But these risks are not summed with risks from other exposures that residents experience at this site”,

Response:

As we discussed, it needs to be remembered that these risks are based on estimates of time that account for virtually all of the time that people spend outdoors. Therefore, it is not appropriate to sum these over multiple exposure pathways. Rather, the single pathway exhibiting the highest exposure (and attendant risk) represents an estimate that is conservative relative to summing over all pathways (see response to comment on Page 2, Top of Page).

Page 29, Middle of Page

Comment:

“Which value is correct?”

Response:

Regarding the comment on this page (and similar comments on all other pages) concerning the disagreement between the values in the text reported as decimals and those reported in scientific notation, in all cases, the scientific notation is correct (as it comes straight from the tables). I guess I just looked at these too many times to be able catch the typographical errors concerning the decimal values. The typographical errors will all be corrected.

Page 31, Top of Page

Comment:

“How was this value determined? From field measurements or trial and error?”

Response:

The value for moisture content was estimated simply by fitting the model to the observed values.

Page 31, Bottom of Page

Comment:

“While this assumption may be valid for current conditions, this is not a valid assumption for longer term exposures because it assumes that the ACM is stable (i.e., not friable)”

Response:

Over any arbitrarily short period of time (such as the periods over which this document is designed to interpret – see tables), use of the concentrations observed in the soil components alone should be conservative for these pathways. This is because such concentrations represent the reservoir of material immediately available for disturbance due to the kinds of activities being evaluated here. Whether any embedded ACM is friable or not, over these periods of time, the presence of such material will not contribute substantially to overall exposure because, even if a piece of such material is disturbed during the activity, the total fraction of time during which such ACM is contributing to the overall exposure is miniscule compared to the time that the free asbestos in the soils is contributing.

While we agree that, over the long term, contributions from any ACM that is embedded in the soil may become important, the evaluation in this report is intended to address time periods that are short relative to the time required for ACM to degrade.

Page 32, Top of Page

Comment:

“This depends on whether this information is being used to make decisions about near-term or long-term exposures. What about exposures that have already occurred?”

Response:

As previously indicated, see last comment, this report is focused on short term risks. It also highlights the current uncertainties that will need to be addressed to properly evaluate long term risks (past or future).

Page 34, Second Paragraph

Comment:

“How was this done? Based on field measurements or trial and error? Seems rather arbitrary.”

Response:

As indicated for moisture content previously, this result was determined by fitting the model to the observed observations.

Page 34, Last Paragraph

Comment:

“Assumes contribution from ACM is negligible, which may be appropriate for the short- but not the long-term.”

Response:

As we discussed, we agree that this is appropriate for the short term, which is the nature of the risks being considered in this report.

Page 34, Last Paragraph at the bottom

Comment:

“Basis for this change” (which refers to reducing the width of the dispersion box from 60 to 30 m)?

Response:

This was done to increase the conservatism of the extrapolations to better account for occasional, extremely unstable weather conditions.

Page 38, Middle of Page

Comment:

“True if assumptions are valid. If material is consistent with what’s been found to date. Using soil only components may not be protective of long-term risks.”

Response:

As we discussed, because we are only considering short-term risks in this document, these assumptions are appropriate.

Page 39, First Paragraph

Comment:

"But they do persist during periods when the kids would be expected to contact soil" (which refers to the hotter drier periods of the year).

Response:

The total fraction of the year that hot and dry conditions persist is substantially smaller than the total number of days that it is assumed that children play outside (350), which is almost every day of an entire year. Thus, it is reasonable to consider that times when these conditions do not exist contribute to lowering the overall risk.

Page 39, Second Paragraph

Comment:

"Not sure that it's 6 months. Most precipitation occurs as snowfall, I think."

Response:

Actually, I looked at some climate data for the area, which I will cite, and it looks like higher humidity and cooler temperatures (as well as increased precipitation) persist for approximately half of the year.

Page 39, Second Paragraph

Comment:

"Really!"

Response:

The statement indicating that the risk estimates in this document can likely be discounted by a minimum of a factor of three are based on the considerations addressed in the preceding few comments.

Page 40, Bottom of Page

Comment:

"Was or is steam pipe present on these properties?"

Response:

As we discussed, I compared Figure 1 of this report (depicting the locations of the samples in which amphibole asbestos structures were detected) with maps of steam pipe locations and there does not appear to be a correlation. Neither do the sampling

locations appear to correlate with locations at which steam pipe or its associated insulation were recently observed at the surface.

Page 41, Third Paragraph

Comment:

“Has a formal comparison of results been completed?”

Response:

Regarding Glove Box Method analyses, I am working to complete a more general comparison, but the comparison for the single sample in which multiple amphibole structures were observed is clearly a problem. While several chrysotile structures (and no amphibole) were observed in this sample when analyzed using the Modified Elutriator Method, only amphibole structures were observed when the sample was analyzed using the Glove Box. Clearly, this is an inconsistency that cannot be explained by sensitivity. This is also described in greater detail in the text of the report.

Page 44, Second Bullet

Comment:

“Seems a bit strong.”

Response:

Per our discussion, I will change the work “contaminated” in this bullet to “compromised.”

Page 45, First Paragraph

Comment:

“How much more data is needed if one amphibole fiber can drive the risk, then does prudence dictate that remediation of ACM should proceed?”

Response:

As we discussed, the current analysis indicating a problem with amphibole asbestos is based primarily on an upper bound estimate from the observation of a single structure (coupled with conservative inferences from the observation of a very small number of additional amphibole asbestos structures spread out over a small number of other samples). While, given the data, the risk estimates provided in this report are the best that we can currently do to bound such risks, we also understand that they are highly likely to be extremely conservative. There are also quality control issues that need to be addressed. Therefore, while we cannot dismiss this as a potential problem, neither can we validly conclude that a problem actually exists.

More importantly, we do not currently have sufficient information to know precisely how to design a measure that would address the amphibole asbestos problem, even if it does exist.

That is why I recommend that we conduct a very limited and very focused additional investigation (on an expedited basis) so that we can obtain the data that we need to better gauge the magnitude of the amphibole problem and to design appropriate strategies for addressing it.

Appendix B

Comment:

"We try to avoid telling people what we think worst-case is. RME may be a better term for this, if defined."

Response:

After giving this much thought, I have decided to keep the term, "worst case" in this Appendix for the following reasons. First, as we discussed, I believe that the exposures and risks estimated are actually more conservative than what might be considered typical for reasonable maximum exposures. Second, because this is intended as a piece to be understood by lay persons, I believe that "worst case" is easier to appreciate and interpret than a technical term of art like "RME." Third, because the version of the document with the comments embedded has already been distributed broadly, it does not make a lot of sense to make this kind of change at this point.